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THE
BIBLE DEFENDED
AGAINST THE
BRITISH ASSOCIATION:

BEING THE SUBSTANCE OF A

PAPER READ IN THE GEOLOGICAL SECTION, AT YORK,

ON THE 27TH OF SEPTEMBER, 1844.

BY WILLIAM COCKBURN, D.D.,

DEAN OF YORK.

> "Some drill and bore
> The solid earth and from the strata there
> Extract a register, by which we learn
> That He who made it and revealed its date
> To Moses, was mistaken in its age."—*Cowper.*

FIFTH EDITION.

TO WHICH IS ADDED A CORRESPONDENCE BETWEEN THE
DEAN AND SOME MEMBERS OF THE ASSOCIATION.

LONDON:
WHITTAKER AND CO., AVE MARIA LANE; AND
BELLERBY AND SAMPSON, YORK.

1845.

PRICE ONE SHILLING.

45.
3. 24.
12.

LETTERS, &c.

MR. PRESIDENT,

I will not trespass on your valuable time by preface or apology.

I object to the theory laid down by Dr. Buckland in his Bridgwater Treatise as to the original formation of the Earth—because that Theory will not account for the many facts made known to us by Geologists.

Dr. B. says, (p. 40, v. 1,) supposing the entire materials of the Globe to have been once in a fluid state—"The gradual abstraction of such heat, would allow the particles of matter to approximate and crystallize; and the first result of this crystallizing might have been the formation of a shell or crust composed of oxydated metals and metalloids, constituting various rocks of the granite series;" other Geologists (and Professor Sedgwick among the number) conceive the Globe to have been originally in a gaseous state, before the sun was created, and by the radiation of heat and by gravity growing solid. But in all these suppositions there is no end of difficulties. How could a gas or a fluid floating in space get any heat?

Dr. B. proceeds (p. 42)—"The detritus of the "first dry lands being drifted into the sea and "there spread out into extensive beds of mud and "sand and gravel." Now here is the next grand difficulty,—upon the granite crust of the world formed like an egg. *There is no dry land, nor water, nor mud.* This absurdity has been several times pointed out to Dr. Buckland, but he is too haughty, perhaps too wise, to notice it.

But it appears afterwards that Dr. B. uses the word land with a somewhat different signification to what we usually attach to it. For he says (p. 50) —"The first granitic crust was broken into frag-"ments, disposed at unequal levels above and "below the surface of the first-formed seas, and "whenever solid matter arose above the water, it "became exposed to destruction by atmospheric "agents, by rains, torrents, and inundations."

The solid matter, then, which the Dr. calls dry land, means nothing but granite heaved up by internal throes above the level of the water, and then as he says decomposed by rains and torrents. But here again we meet with the old difficulty. Where did the first-formed seas come from and how could there be any rain? There was no sun to draw up the vapour—no atmosphere to support it, at least none that has been accounted for.

Far, therefore, from this nebulous theory enabling us, as La Place contends, to dispense with a Creator. It appears to require his interference again and again at every corner and at every moment.

Dr. B. says, moreover—"That these rains and "torrents acted with great violence, and washed "down and spread forth in mud and sand and "gravel upon the bottom of the then existing seas "the materials of the primary stratified Rocks "which become gneiss and mica slate, &c."

Now passing over the many links wanted to account for the formation of the atmosphere, the water, the rain, the inundations, &c., let us suppose all this to have happened, and the staly rocks thus to have been formed.

We come no nearer to the formation of the habitable earth.

But says the Dr. (p. 51)—"In the detritus "thus swept from the earliest lands into the most "antient seas, we view the commencement of that "enormous series of derivative strata which *by* "*long repetition of similar processes* have been "accumulated to a thickness of many miles."

It seems, then, that from the original Granite Rock thrown up above the water, or from a second upheaving of the same, and by the action of the same agents, all these various products were formed.

From the same or similar Granite Rocks came forth gneiss, and porphyry, and slate, and red sandstone, and coal, and lime, and salt, and clay, and chalk, and marl. Till the sea finally shifted its bed and left these various products dry, there was never, according to Dr. Buckland, any other material above the sea but the granite stones. As fast, too, as the rain decomposed these, the mud, &c., was washed away into the sea, and nothing still remained but the bare rock.

Where, then, did the varieties of animal life in the earliest periods find food and nourishment?

"We find," says Dr. B., (p. 63,) "the remains "of land animals accumulated in prodigious quan-"tities in the 'Transition series.'" Now this series he supposes to be among the earliest products of the decomposed granite. But the animals must have lived before the detritus which overlaid them or contained them in the sea.

On what had they fed?

We find also (vol. 2, 12) an enumeration of many trees found in this series.

On what had they grown?

Dr. B. (p. 69) confesses himself unable to account for the source of the immense masses of Carbonate of Lime that compose nearly one-eighth of the whole Crust of the Earth.

It could not, he says, come from the Granite Rocks, because they contain so very little. Whence did it come? In the very earliest formation of the transition series we find what is called Transition Limestone. It could have come from nothing but the original granite,—since, according to Dr. B., there was nothing else.

To credit the theory of Dr. B., we must then suppose that the first exposed Granite was decomposed by the mere action of rain water—which is contrary to our limited experience—but not impossible.

We must suppose that Lime was a component part of the first Granite Crust. For though some persons have suggested that the immense quantities of limestones proceed from fish-bones, it only throws back the question—Where did the fish get the lime of which their bones were formed? Bones are made of lime secreted from food; they cannot generate themselves. But even if Dr. Buckland could account for the lime, from whence could he procure the carbonic acid gas which has converted it into carbonate of lime, in which state we find it. In a recent geological publication the author informs us that he has ascertained from experiment that there are 16,000 cubic feet of carbonic acid gas in every cubic foot of limestone. Where could all this gas come from?

It has become the fashion, indeed, among the modern disciples of Dr. Buckland, to help him out of his difficulties by asserting that the atmosphere was all carbonic acid gas, in which vegetables might grow but life could not endure. But where did such an atmosphere come from?

It is all conjecture—wild impossible conjecture.

But further to agree with Dr. Buckland, we must also suppose that fishes could live in the original fresh water, without any other food than water; and that animals could live and trees grow on the bare granite rock.

We must further suppose that mica, felspar and quartz could be so thrown into new combinations by the mere agency of rain water that they would produce the almost infinite varieties of earths and rocks and strata with which the world is diversified.

After giving credit to Dr. B. for all these numerous improbabilities, we still meet with new difficulties.

He and other Geologists inform us that the order of the deposits was the following:—

The Coal measures between the old and new Sandstone (Murch. p. 9); beneath these the silurian or secondary deposit, the transition series, and the original crust of the Earth; above the new red sandstone, the saliferous marls, the lias, the oolite, the chalk, the sand. Having formed the Theory they invent the facts to suit it.

But when we come to compare the facts lately made known to us by Geologists, we cannot reconcile them with this hypothesis.

In various plates representing sections of rocks in the Silurian regions, as shown by Mr. Murchison, not one solitary instance occurs of such a succession of strata.

All Geologists agree that the trap rocks have been forced up by submarine volcanoes *since* (since observe) the upper deposits were placed upon them. But if the bottom of the sea was quiet when these successive deposits flowed from the elevated and decomposed land—what prevented them *all* from taking their relative positions in every place?

We find, however, all Pembrokeshire without any late formations.

We find one bed of Lias in Shropshire (M. P.) but no other within 200 miles.

The effects produced (says M. p. 420) by the elevation of the Malvern Hills are striking. For a distance of about five miles the old Red Sandstone, Ludlow and Wenlock rocks are completely inverted, the younger formations being overlaid by the older. The same confusion prevails about the Hundred House and Abberley. Now a single outburst of the Rock below would not effect this. It would raise the incumbent strata from their horizontal positions, but it could not raise the lowest to be highest while it rose only as a cone, against which the strata would rest.

One more objection and I have done.

In the productive coal field of Cornbrook, near the Clee Hills, Mr. M. (p. 127) describes strata of coal lying near the surface, covered only by broken basalt, and resting directly on syenite, which he says has burst up by volcanic action from the lowest level where such syenite is usually found, to the very top of the land and fallen over the coal.

But what has become of all the Silurian rocks, and old red sandstone, and carboniferous limestone, which should have been deposited before the coal strata could have found a place. The granitic eruptions might have dislocated those strata, but could not have annihilated them.

Then again how was the supposed wood converted into coal—Mr. M. adds, " near the basalt, the coal was changed into a sooty substance in which were flakes of anthracite—it was still bituminous, and gave flame under the blow pipe."

It was Coal no doubt—but how, if once Wood, did it become Coal? There was nothing but syenite above and below it—and scarcely any super-incumbent pressure.

Mr. Murchison finds large boulder stones of pure Granite at the very top of the syenite chain. These have been unchanged though exposed to rain and wind as far as memory can reach. But how came they there?

Mr. M. brings them from Scotland; Dr. B.

from his original depot—but how they rolled down into the valleys, and then up the highest hills is unexplained.

I could instance innumerable other discrepancies, but I fear to weary you.

Suffice it to say that the Dr.'s theory will not account for the various facts made known by Geologists. It is really a tissue of absurdities too palpable to escape the notice of a schoolboy.

Turn we now to the theory which I present to you, to account for the facts which Geology has made known to us.

I suppose that every thing in the world was made at one time; nothing has been added, nothing taken away.

The world was as now, land and water, both resting on a strong basis consisting of the granitic rocks.

So the world continued for nearly two thousand years—the land, the air, and water being all thickly peopled.

There then burst forth, by natural or supernatural means, numerous submarine Volcanoes. The first broke through the crust of Granitic Stones, and threw up, but not to the top of the water, a great quantity of these pulverised and perhaps melted stones mixed with clay, and which slowly subsiding in the tranquil sea, produced the strata of the transition series.

Scarcely had these taken their positions at the bottom of the water, when a new expansion raised the mouth of the Granitic Volcano above the level of the sea, and it threw out new combinations of materials from the bowels of the earth, falling also rapidly to the bottom of the sea, destroying the fish by their heat, and enclosing them in their hard embrace.

While this is going on at Sea, I suppose that immense torrents of rain also, by natural or supernatural means, were rushing down from the higher lands, and sweeping many animals and many vegetables into the sea, which the produce of the volcanoes would overwhelm and fix at the bottom.

The first strata thus formed, which we call the transition series would thus simply meet in their way with a few crawling reptiles, crinoidea or trilobites, and some accidental produce of the land. But the second deposit or secondary series would find the varieties of Saurians, who previously being on the edge of the waters, would be the first carried away by the flood.

Well, let all these subside and settle themselves in their places, and then suppose the same operations to recommence—fresh volcanoes bringing every day fresh materials from under the sea, and the rushing water overwhelming and bringing down into the sea more animals and more vegetables and a great part of the mould of the earth, to be in succession forced to the bottom by the descending stones from the volcanoes.

What should we be likely to find in the next deposits?—The heavy animals who in the flood that is covering the land are unable to fly fast enough to the hills.

Let these same causes operate a few weeks longer, and new strata will every day be formed and new parts of the land be washed away, till it becomes lower than the original crust beneath the waters which crust these frequent volcanic heavings have raised high above the level of the land.

The Coal, I suppose (though I insist not upon it) to ooze out in a liquid state, like lava from the side of the volcano—while the old red sandstone being a part of the original earth is depositing itself on the declivity of the Cones. The Shale in the meantime (which is coal and silex) is thrown up high into the air, and falling with velocity to the bottom, carries down upon the coal the large leaves of ferns and branches of trees and other matter which it meets with in its descent. The Coal afterwards becoming cold, shrinks in bulk, and leaves many of these vegetables, pendent between it and the shale.

Now comes the new Red Sandstone and slowly covers all,—and then supposing that the volcanoes cease, the sea would be boiling with heat and rushing currents. It would be heaving up the particles of silex, and of clay, and of mould, and the carcases of dead animals, marine or terrestrial.

These things gradually sink down.

The heavier earths and stones and the heavier bodies going first and going together.

Then those things whose specific gravity was less—the lightest last.

Then the Lime from the earth mingling with the clayey and perhaps highly carbonated matter from the volcanoes, would form abundance of Lias, which, adhering to the Ammonitees and many other animals, would make them too heavy to float any longer, and would carry them to the bottom.

In the mean time the purer lime, tossed and rolled about by the boiling waves into little balls, would unite in the oolite form, and spread itself far and wide where no high raised hills impede its extension. Lastly the chalk subsides and the sand—but little remains for these to enclose—and little is enclosed within them.

The waters now run off, the old Earth is washed away. Its crust probably broken in. It sinks below the lowest part of the antient bottom of the sea.

The waters thus run off from the former sea and leave the world as we find it.

I now assert with confidence that there is no fact made known to us by Geologists which may not fairly be accounted for by this theory.

Only allow that an immense flood of water might bring the antient earth and every thing upon it into the sea, and that at the same time repeated volcanoes bursting up from under the sea might throw different combinations of stone and lime, and clay into the air, which falling with violence into the sea would carry with them the produce of the earth to form strata at the bottom. Allow this not improbable coincidence and every thing now visible is explained.

You will of course perceive that my theory accords precisely with the account given by Moses. I do not however press it upon you in consequence of that accordance, but because I contend that every modern discovery may be accounted for by this theory, and cannot be accounted for the theory of Dr. Buckland.

If I deceive myself, I hope that some of the better informed persons here present will communicate to me some fact which he considers to be inexplicable by the means which I have suggested.

APPENDIX.

Since the preceding was spoken, the following correspondence has taken place.

THE DEAN TO PROFESSOR SEDGWICK.

The Dean of York presents his compliments to Professor Sedgwick, and sends herewith a copy of the Dean's speech this morning.

As Professor Sedgwick, in his reply, confined himself almost exclusively to remarks upon the Dean's supposed ignorance,* he requests of him to answer the present pamphlet in print.

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* Dr. Buckland, in a letter to Sir R. Peel, takes up the same line, and dwells upon the inexperience of the Dean, who ought, as the Dr. thinks, to acquiesce without question or remonstrance on the conclusions of a person so eminently gifted as Dr. Buckland.

The Dean is willing to admit the Dr.'s superior knowledge†—but cannot allow him to draw conclusions from the utter inexperience of himself.

The Dean has been constantly employed for many years in examining all the accessible strata in Devonshire and Yorkshire, and particularly in this advantageous locality (Somersetshire)—where innumerable stone quarries are open on every side, and deep perforations of the Earth are daily made in search of Coal.

The Dean has done also that which Dr. B. has never done.

† Knowledge and Wisdom far from being one
Have oft-times no connexion.—Cowper.

The question between them is greatly interesting to the Christian public, and deserves a full discussion.

Will the Professor then assert that the principal facts made known by Geologists (concerning which facts there is no dispute) can be accounted for, by supposing with Dr. Buckland, that the granitic rocks were the sole material out of which the present world was constituted, and by the agency of rain water alone?

Or will the Professor offer some other theory which may better explain the acknowledged phenomena?

Under either view the Dean hopes that the Professor will trace, step by step, the supposed progress of the world, from a nebulous state to its present solid appearance.

The Dean, wishing for information, more than for contest, further asks, that the Professor will state some geological fact or facts which he con-

He has passed on foot through all the tunnels of the railroad between Bath and Bristol before they were bricked up. He went with Mr. Brunel through the longest and deepest of them, and examined the strata on the day when the communication was first completed.

But this is all irrelevant—the Dean is not writing about himself, but about the antiquity of the world, and he again and again defies any of these men of superior talents to point out an appearance in any of these tunnels, or in any other excavation which should induce a reasonable being to believe that the world has existed more than 6000 years.

ceives to be incompatible with the supposition that an immense flood brought the materials of the former earth into the sea, and that they were fixed there by volcanic agency.

The Dean considers himself at liberty to publish this note, together with any answer with which the Professor may honour him.

Deanery, Friday, Sept. 27th.

To this note no answer being received on Monday morning, the Dean wrote to Mr. Warburton as follows :—

My Dear Sir,

After the Discussion on Friday morning last, I wrote a letter to Professor Sedgwick, of which I enclose a copy.

He has sent me no answer, and, doubtless, treats my letter with the contempt which he thinks that it deserves.

I turn therefore to you, and ask for a further public discussion concerning the origin of the world. It is not a question for debate merely among individuals, but one in which the whole human race is interested. It appears to me, and to many wiser men, that the theories of the Geological Society are incompatible with Christianity.

Professor Sedgwick says that these theories, if rightly understood, would confirm the truths of revelation. My answer is—that if that be the case these theories are *not* rightly understood by me, and by thousands of others.

Is it not then your bounden duty to explain them, and to wipe away that taint of Infidelity with which we conceive you (however erroneously) to be surrounded?

Why, it has been asked, did Galileo obtain credence for his philosophy which was at first so much opposed? Because he and his supporters began with the simplest axiom, and rose up, step by step, to the highest truths of science—proposition followed proposition—no link in the chain was wanting till the lowest and the highest intellect were equally convinced.

I pray you then, Sir, to appoint a time when I may put some questions publicly to Professor Sedgwick, or any other gentleman deputed by you, who will condescend to answer them.

It will give me the greatest satisfaction to have my doubts and difficulties removed, and to find the Geological Society wrongfully suspected.

If you will name either Tuesday or Wednesday morning for giving me that satisfaction, I will send a list of my queries to you the day before, that the respondent may be duly prepared.

But if, like Felix, you prefer "a more convenient season," I would fain exact from you a promise that you will endeavour to induce the Geological Society to put forth, ex cathedrâ, a printed statement of their opinions respecting the Creation.

I trust that they will tell us, ab ovo, step by step, and in full detail, how they deduce the present appearance of the different strata from the supposed nebulous condition of the world.

I have the honour to be,
My dear Sir,
Your obliged and obedient humble Servant,
WILLIAM COCKBURN.

To this letter the following answer was received :—

Very Rev. Sir,

In answer to your application addressed to the President of the Section, requesting to have the discussion on the subject of your paper of Friday last re-opened, I am directed by the Committee of the Section to inform you that, as there is no precedent for re-opening the discussions of the Section, they consider that it would not be proper for them to comply with your request.

I have the honour, &c.,
D. F. ANSTED.

Whether this refusal arose from a lofty or an humble opinion of their cause, it left the question of their Christianity where it was. In the mean time, that is, in the course of Monday, there came an answer from Professor Sedgwick, apologizing for the delay, but expressing a wish that his answer might not be published. It is sufficient therefore to state as the outline of it, that the

Professor declines to support the nebulous theory. He mentions that it was first put forth by Astronomers and adopted by the Geologists, as a matter of indifference to them whether true or false.

The Professor only insists upon the long antiquity of the world, which he conceives to be proved by unassailable evidence.

To this letter the Dean immediately sent the following reply:—

My Dear Sir,

I thank you for your note, which, not expecting to receive, I wrote last night to Mr. Warburton to ask for another public discussion.

I shall be better pleased, however, if you will condescend to reply to my queries in writing, and to give that instruction, which you very justly said that I needed.

The question between you and me, I once more repeat, has nothing to do with the facts of geology; which are admitted, and have long been studied by me, and confirmed in most cases by my own ocular observation.

I still think that a literal interpretation of the Mosaic history will account for all these facts, and I have not yet seen any other theory which will account for them.

My great objection to the geologists is that though we allow them millions of ages, their system can find *no beginning*.

The nebulous theory is really nonsense. To suppose that *heat* caused the outside of a semifluid to contract into stone, is to suppose a fact in direct opposition to all experience. Then on such a heated body there could be *no water*, and, therefore, no steam, and no rain. All Dr. B.'s original agents are wanting.

But you give up the nebulous theory. May I not ask you to substitute something else?

If the world existed for 2000 years much like to what it is at present, and was then broken into fragments, there is no absurdity in supposing that the various products thrown up by volcanoes might fix these fragments at the bottom of the sea in the order that we find them. Indeed the confusion which must have attended such a convulsion will account for all the various anomalies which we meet with in various places.

Whereas no other theory that I have seen will explain how the same formations appear in the same succession in very distant parts of the earth, while elsewhere and in the same neighbourhood some are mightily increased and some entirely wanting.

You speak of facts which prove the long necessary existence of matter—you mentioned one in your address on Friday—that a vegetable (I think) which took a long time to grow was found embedded in a very extremely thin stratum of stone, which must, therefore, have taken a long time to form. Surely this is not conclusive evidence.

The vegetable might have grown elsewhere, and the first blow of the stone might have prostrated it. If I find an oak tree struck down by lightning, I might prove the tree two hundred years old; but would it follow that the lightning was two hundred years in felling it?

Why the Creator annihilated many of the creatures which he had once created (as we know they are annihilated) is not for us to attempt to explain.

They might not be fitted for the change in the world which he chose to make. But the disappearance of those creatures, and their being the first destroyed in the great catastrophe, has no bearing upon the fact which I contend for, that the present succession of strata might have taken place in six months as well as in six millions of years.

If you will be pleased to communicate to me *some other facts* which you conceive to require an immense length of time to account for, I shall be better able to appreciate the weight of your arguments.

As you mention that you are at present much engaged, I will not ask for an immediate answer to this letter; but I shall still always look for it with much impatience.

I have the honour, &c., &c.

To the Inhabitants of York.

My dear Fellow-Citizens,

The philosophors are going. We may I think congratulate each other that during their much feared visitation among us they have certainly not established any one fact which would weaken our faith in the sacred historians.

Moses tells us (Gen. vii. 11, 12) that the windows of heaven were opened, and that it rained (a supernatural rain no doubt) for forty days and forty nights. St. Peter tells us (ii. 3, 5) "that by the word of God the heavens were of old, and the earth standing out of the waters, whereby also the world that then was being overflowed with water perished."

It appears, then, that the old Earth was washed into the sea, and, at the same time, says Moses (Gen. vii. 11, 12) "the fountains of the great deep were broken up," indicating, no doubt, that submarine volcanoes raised their heads above the waters and threw out various combinations of strong matter, which, falling to the bottom, carried with them the several products of the earth.

"And the waters (said Moses, Gen. vii. 19) prevailed exceedingly upon the earth, and all the high hills that were under the whole heaven were covered. Fifteen cubits upwards did the waters prevail, and the mountains were covered. And the waters prevailed upon the earth 150 days."

(Gen. viii. 2.) "And then the fountains of the deep, and the windows of heaven were stopped, and the rains from heaven were restrained." (Gen. viii. 3.) "And the waters *returned* from off the earth continually, and in the tenth month were the tops of the mountains seen." (Gen. viii. 13.) "And after eleven months, the waters were dried from the earth."

Now, brethren, how fully is all this confirmed, and how little refuted by what we see. The different strata of stone from the mouth of the volcanoes enclosed the animals and vegetables from the ancient earth while the volcanoes raged, and after 150 days these mighty agents ceased to act. But the waters were left in a state of boiling agitation, tossing up and down all the various, immensely various, materials which had been thrown into the sea. The commotion gradually subsides; every kind of matter according to its specific gravity goes to the bottom. If the lime and clay, uniting into lias, descends in one place full of ammonites, which are of similar specific gravity, it will do the same in all places, and you may expect to find ammonites embedded in the lias in England, in Germany, and in America.

If the lighter oolite finds itself descending in any place surrounded by lighter shells and lighter bones, the same cause will produce the same effect in every locality.

In short, my Christian friends—the more minutely you consider the account given by Moses the more confidently will you expect to find the precise appearances, which *you have found* in the secret bowels of the existing earth. After a lapse of 4000 years the discoveries of geologists have afforded a stupendous proof of the truth of the Book of Truth. They were originally brought forward as an argument against revelation; but they really turn out to be the most decisive evidence in its favour. The Philistines are beaten with the very weapons they had prepared against us, and the head of Goliah is cut off with his own sword.

York Deanery, Oct. 29, 1844.

My Dear Sir,

I again offer you my grateful acknowledgments for the long letter which you have bestowed upon me.

I wish that you would allow me to publish it. It has no appearance of hasty composition, but is evidently the work of an able writer perfectly conversant with his subject. It would, I doubt not, give complete satisfaction to all the members of the Geological Society.

But, unfortunately, there are thousands who think with me that that society have had too much respect for the argumentum ad verecundiam, and have never allowed their own unbiassed judgment to investigate theories introduced by former great names.

To those many persons who agree with me on this point, your letter will carry no conviction.

The nebulous theory is again brought forward, but in spite of all my requisitions nobody will tell me exactly what it is.

Am I to believe that the earth was once in a fluid or gaseous state, suspended in infinite space without the sun or the stars, without an atmosphere, without gravity, without electricity? If so, how could any change take place? If the crust did not crystallize in a day, how could it crystallize in a year, or in 10,000 years?

Unless, however, some one will fully communicate what geologists believe to have been the steps whereby the Earth received its present form, I fight, probably, against a phantom raised by myself.

Let us turn, then, once more to the theory which I ventured to present to you.

To my proposition that an immense rain might carry all things on the face of the Earth into the Sea, it has been objected that, if by *rain* I mean the natural moisture of the atmosphere, this postulate is denied.

But, my dear Sir, of course, I do not mean such rain—I mean a supernatural rain, caused by the will of God.

Whether He made use of natural means to a certain extent, by causing a great part of the waters of the Ocean to rise into the skies, or simply willed that it should so rain, I say only that there may have been such a rain producing such an effect.*

It is universally allowed that the submarine volcanoes might at the same epoch have broken upwards the submarine crust of the world. But it is said that my third postulate about the poles of the Earth being moved "is against the first principle of physics," no internal movement could so change the axis of the Earth's rotation.

Can you or any one have sufficient knowledge of what might have taken place, when vast continents were moved from one side of a sphere to another, to say what then might or might not have been the effect of such a movement, when also you remember at whose command the grand convulsion came.

But it is said further "the figure of the Earth "contradicts this gratuitous hypothesis."

How so? The Earth assumed its present form when first a rotatory motion was given to it, and though the poles might be moved, still every particle at the surface would revolve in a plain perpendicular to the orginal axis, and subject to precisely the same effect of rotation round that axis.

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* See a note in Mant's Bible on Gen. 7, xi.—Bishop Watson.

Again, it is asserted that plants and trees have a structure " to fit them for a change of seasons; do " I suppose that deciduous trees were created after " the flood."

I see nothing incredible in supposing that deciduous trees did *not* shed their leaves before the flood, or shed them at certain periods without the intervention of frost.

" If any thing is plain in scripture," it is moreover urged, " It is that there was no change in " organic nature at the flood."

Now, in the first place, I find nothing about this in Scripture, neither have I said anything about it. That all the animals which went into the ark came out unchanged, may reasonably be supposed; but that some animals, which previously existed did not reach the ark, and that some which came out of it might afterwards have perished, is by no means improbable.

But, again, it is argued that the geological creations are " not like living nature, therefore they " are not of the creation coeval with man."

The Geological Creations are not the same, but to a certain extent they are *like* living nature. They have all heads, and mouths, and teeth, and alimentary canals, and feet to carry them, and eyes to see with. There is nothing in their apparent form or nature which should prevent their existing in the same atmosphere as antediluvian man.

The last verse of the eighth chapter of Genesis bears slightly on the subject of the Poles of the Earth being shaken during the great catastrophe. When God was well pleased at Noah's sacrifice, he said,—Gen. 8, xxii., "While the earth remaineth, "*seed-time* and harvest, and cold and heat, and "summer and winter, and day and night shall not "cease." Day and night had been named before, but the other words had never been used before. Though there is no absolute proof in these things, yet an inference may be drawn that the first change of seasons now began.

My account of the strata under our present Earth is next disputed, and it is affirmed that the beds are not arranged according to their specific gravities.

Now observe that I claim this only for the latter or higher deposits, and I cannot help imagining that the contrary assertion will be difficult of proof. A piece of lias appears more solid, and weighs more than an equal magnitude of chalk. In a matter, however, so difficult to be ascertained, let me ask if the strata did not take their places according to their specific gravities, by what means did they acquire their present position?

It is objected to me that in the **boiling* sea, "Such as I describe, the moluscous creatures must

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* Used metaphorically.

" have died, and the vivalve shells must have been
" all open or divided."

The water might not have been hot enough to produce these effects, or the shells might have been involved in clay and lime *before* the water was so heated.

You then inform me of many geological facts referable to the chalk formation, from which you deduce the long existence of the world. Zoophytes have been found adhering to the rocks on which they grew, and some supposed bottom of a sea covered by chalk perforated by pholas.

In the first place, no one can prove that these combinations have not all been brought from a distance; but supposing them to have been always in their present position, what do they prove? Only that they have been covered over by a subsequent deposition of chalk. They show indeed that a world had existed prior to their being covered over, but they shew nothing more.

" Instances are next quoted, in which it can be
" demonstrated that the lower rock was solid, and
" its fossils all petrified before the upper rock was
" formed upon it."

There are so many facts in opposition to this statement that I shall not easily be convinced of its accuracy.

Dr. Young in his geological work (p. 25,) enumerates from his own personal observation, *a* *great many* instances in the neighbourhood of Scarbro' of *bent* strata, arising from breaks or cracks, shewing that the mass was flexible when the break took place. "Now as these bendings affect the "lowest beds as much as the highest, the one cannot "be much older than the other, the whole having "been in a semi-indurated state at the same "time."

Consider also in what numerous cases the fossil animals are flattened, and broken, and mutilated, all showing the softness of the matrix, and the violence of the pressure from above.

Lastly, it is said "that portions of several fossil "forests have been seen, the trees standing where "they grew, their roots with the soil."

Permit me, with all deference to reply, that no one can be certain *where* these or any other vegetables grew. I have seen, as I believe you have seen, the land slip near Lyme. There was a field of wheat growing, ripening, harvesting in a position far from the spot where the seed had been sown. There were trees standing and growing on one side of a valley, which had stood and grown on the other side.

If such changes could be made by a little extra rain, who can tell how far an inundation, which destroyed a world, might carry a few trees and the ground on which they grew.

I hope, Sir, you will not think me too importunate if I trespass still upon your time and patience, by asking an answer to the following queries :

1st. What is the *whole* nebulous theory, that is, how do you deduce, step by step, the present state of the earth from a gaseous origin?

2ndly. Why do you assert that the calcareous strata were not deposited according to their specific gravities?

3rdly. Can you state any more geological facts, from which we may infer the long duration of the world?

I have the honour to remain, Sir,
With much respect,
Your obliged humble Servant,
WM. COCKBURN.

P.S. I once more beg permission to publish your letters, or at least the next letter with which you may favour me. The eye of the public has been much drawn to this controversy, but my readers will be little satisfied with garbled extracts from that particular part of the correspondence, in which they expect to find the most valuable information.

York Deanery, Nov. 4, 1844.

To R. I. Murchison, Esq., President, and to the Members of the Geological Society, London.

GENTLEMEN,

I take the liberty of enclosing to you two letters, which I have lately addressed to Professor Sedgwick.

To these letters I have received polite replies, but in his last obliging communication the Professor declines all further discussion, and repeats his request that his letters may not be published.

I feel myself, therefore, at liberty only to state, that in answer to my three questions, he simply renews his assertion that the calcareous strata were *not* deposited according to their specific gravities. He refers me for proofs of the long duration of the world to other writers, and he takes no notice whatever of the nebulous theory.

I might, perhaps, have reason to complain of the learned Professor thus quitting the field at the moment when the contest had arrived at the most interesting point. But I confess that his answer did not surprise me; it was exactly what I expected.

The members of the British Association have always been accustomed to act in strict unison. They discountenance all difference of opinion, and seem bound jurare in verba magistri. Professor Sedgwick could not therefore with propriety appear publicly in opposition to the nebulous theory, and at the same time considerations for his own character would not allow him to stand up in support of what he knew to be an absurdity.

Dr. Herschel was the first person who to surprise the world, and make a name, put forth the said nebulous theory.

He ventured to assert in 1811 that the stars were all worlds; that at first they were streaks of light which he calls *nebulosities*; that these by mutual attraction became nebulæ; that the nebulæ concentrated by gravity formed themselves into planets, and afterwards into stars, which shone by their own light, and are now blazing worlds. (See J. M. Good's Gallery of Nature, p. cxi.)

This wild fancy received but little countenance, and provoked but little discussion, till in a luckless moment, geologists determining to put forth something which might also distinguish themselves, and astonish the uninstructed, adopted this theory of nebulosities, and further said that if stars could so make themselves, why should not our earth also have been a nebulosity, and gradually have made itself even as we find it.

But see, gentlemen, how totally these nebulositists fail and stumble at the very commencement of their system. They tell us that the outside of these gaseous vapours were crystallized by the radiation of heat. But how did they ever acquire any heat? Could a gas floating in infinite space before the sun was formed, be hot? No say they, but *after* the sun was formed he communicated heat to the nebulæ. But that heat would expand the gas and not contract it. It would also communicate the heat in the first place to the outside, which instead of radiating heat would concentrate it. No, gentlemen, nebulositists!—You must invent something more tangible than this, if you wish us to accept you for our guides, and to join with La Place in denying the necessity of a Creator.

Gathering myself information from the highest source, I have laid before you a plain and simple account of the origin of the world. I have offered an explanation of every phenomenon which geology has opened to our eyes. What have you to object to these simple arguments?

You say that there are geological facts which prove the long existence of the world through many ages. I say there are *no such facts*. Here we are completely and plainly at issue. Produce then some one or more of these facts, and if I cannot fairly account for them without supposing the very long duration of the Earth I am beaten! I am silenced! But if you do not produce such facts, and retreat like Professor Sedgwick from the challenge, confess, or let your silence confess, that the whole doctrine of a prœ-Adamite world has been a mistake, too hastily adopted by men of talent and learning, and too apt, like all other persons, to draw general conclusions from a few particular facts.

I now beg of you Mr. Murchison, as President of the Geological Society, to read these letters at some one of their meetings, and I humbly ask that you, or some other member of that valuable *body will condescend to give me an answer to the questions which Professor Sedgwick has declined to meet.

1st. What is the whole nebulous system? That is, how may we adduce, step by step, the present condition of the Earth from a gaseous origin?

2ndly. What are the facts, or some of the facts, which should induce an unprejudiced person to believe in the very long pre-existence of the World?

I come not forward to intrude myself upon you for the sake of notoriety; but I am anxious to ascertain and to teach only what is true. And impressed with a conviction that every thing which I see or hear is opposed to the supposition of a long duration of matter, I seek anxiously to know why so many persons have arrived at a different conclusion.

I have the honour to be,
Mr. President and Gentlemen of the Geological Association,
Your obedient humble Servant,
WM. COCKBURN.

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* Most valuable, as having furnished us with unexpected and unanswerable proofs of the waters having once covered the existing Earth.

The Author having received a letter from Mr. Murchison, declining to offer any thing in defence of the prœ-Adamite theory, wrote also to Dr. Buckland, to whom he pointed out the evil of allowing so important a subject to remain in a state of doubt. The Dr., like the others, offered no arguments in defence of his theory, and declined to have his letters published.

It appears, then, that we are in possession of all the arguments (if arguments they can be called) by which the very long duration of the World was once tried to be established. Dr. Buckland, in an early period of geological investigation, put forth some crude and ill-considered theory on this subject, which was received by others* with a tacit approbation, because no one had considered the matter, and no one could dispute or deny the Dr.'s assertions.

It seems, however, from the little notice now taken of this hypothesis, that more experience has thrown a doubt upon the minds of Geologists respecting this first crude supposition; but being fearful of exposing themselves in its defence, they decline all controversy and leave the bantling to its fate. But why should we then drag it again into notice, or be so anxious to point out its absurdities? Because the Dr.'s followers and admirers still refer occasionally to that publication for the basis of an attack upon our revered religion.

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* It has ever been so at the beginning of any science. The vortices of Descartes were credited for a while as much as the granite of Buckland jumping up and down like a Jack in a box; and there are still old Chymists who adhere to caloric and phlogiston, though they imitate the great Heresiarch, in no longer defending their favourite fancies in print.

Some men, indeed, have endeavoured to reconcile the doctrine of a long existing prœ-Adamite World with the account given by Moses. But such endeavours fail. No reasonable man can believe in the phantasies of Geologists and in the truth of the Bible.

Moses says that the Almighty Creator himself appeared to him and told him that He made the heavens and the earth, the sea and *all* that in them is—*all* observe—mollusks, vertebratæ, mammalia—*all* in six days. Dr. Buckland and his myrmidons declare that it took the Creator many thousand years to make certain combinations of stones and certain animals, and then to cover them with another creation of stones and animals, and these again with a third creation, and so on. Mr. Murchison enumerates 96 different compositions one above another over the coal formation in Siluria. How many worlds were below the coal does not so accurately appear; but in spite of torturing Hebrew words into all kinds of various meanings, in spite of every art and artifice, it is quite impossible to reconcile such a congeries of new and successive formations at different epochs, with the simple fact of a six days' creation.

It is most important, then, for all those who wish to uphold the book of revelation, to weigh maturely and without prejudice every argument which can be urged against as well as for the narrative of Moses. And it is indeed most gratifying to discover that every day's experience confirms that sacred register; and that all the efforts of human pride and vanity can produce so little to shake our confidence in that inspired historian.

Besides the few facts brought forward by Professor Sedgwick, it has been further urged that the creatures whose fossil remains appear in the lower strata seem to have had a less perfect organization and less perfect intellects than those now in existence. All this is wild and somewhat presumptuous conjecture.

But suppose that it were true, what would it prove? but that they took not the same means of escape as others in the great convulsion, and were the first destroyed. The fact, if proved, has no bearing on the question before us.

These idle suppositions and irrelevant facts are all that I can find to warrant a belief in the long existence of the world.

It is scarcely credible that the learned Professors are acquainted with any other proof. They would hardly allow me thus to beard them and challenge them in the face of the public, if they could really defend their puerile hypothesis by any rational arguments.

It is to be hoped, then, that all thinking persons in this country will repudiate every attempt that may be made by clamour and arrogance to revive this dangerous delusion.

The doctrine of a prœ-Adamite world was originally put forth by presumption acting upon inexperience, and has been continued and propagated by pride and vanity, extensively aided by the indolence of credulity.

When the lecturer produces before the eyes of young persons just come from school a number of large stones filled with the shells and fossils of polysyllabic monsters, and tells them of a time when these creatures were the sole inhabitants of a pristine world, and lived in social intercourse uninterrupted by man, how readily does a doctrine so new, so poetic, so wonderful, strike upon the ardent mind of youth. They look upon the lecturer with astonishment and reverence,

> " And still the wonder grows
> How one poor head can carry all he knows."

The lecturer is pleased with the homage of their applause, and determines to tell them at the next lecture something more astonishing than the wonders of the last. And thus the natural fondness of the human mind for that which is above its comprehension induces the multitude to adopt so pleasing a delusion, and to oppose itself with vehemence and anger against all those who by sober argument would attempt to undeceive them.

Oh, Oxford! so long the seat of learning, religion, and orthodoxy—who could have believed that out of thee should come a cherished voice leading the children committed to thy care directly to infidelity and indirectly to atheism.?

Korah and his company in ancient days took men and stood up against Moses in the sight of the congregation—but the earth opened and proved that Moses was the prophet of God. Something similar has been acted in this our day. The modern Korah and his party have taken men, alas! how many men, and they have also stood up against Moses in the midst of Israel. The earth has been opened, and has shown such confirmation of the sacred story that Moses might say again —" Hereby (even by the chasms of the earth) ye " shall know that the Lord has sent me."

But hold, says Dr. Buckland, presume not to examine anything with your own eyes. It is only my followers who have the blessing of sight. The rest of the world are blind and ignorant. " When " Geologists differ (I quote the Dr.'s own written words) " the unlearned should suspend their " judgment,—when Geologists agree the unlearned " have only to acquiesce."

That is to say, if Sedgwick and I pronounce that

Mahomet was a true prophet, all the deans and dunces without asking further questions should start for Mecca.

To those who have been persuaded in obedience to this high authority to discard the Bible it must be a source of great consolation to find that there are men so divinely gifted as these Geologists to guide them through the gloomy darkness of the world.

But since there is a remnant, and I trust a considerable remnant left, which has not bowed the knee to Baal, nor acknowledged the authority of his priests, I say to them, as Joshua said of old—
" Choose ye this day whom you will serve—the God
" whom your fathers served, or the Gods of the
" Amorites among whom ye dwell. As for me and
" my house we will continue to serve the Lord and
" to worship the mighty Maker of the universe."

PRINTED BY H. BELLERBY, GAZETTE-OFFICE, YORK.